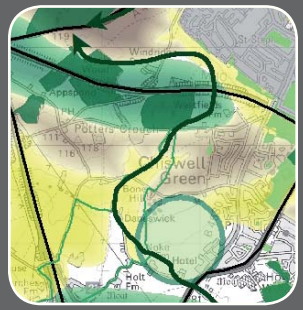
ST ALBANS DISTRICT GREEN INFRASTRUCTURE PLAN: APPENDICES



Prepared for St Albans District Council
by
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Landscape Management

Masterplanning

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1 Stakeholder consultation record: Stakeholder event, St Albans District Council, 1st February 2011

St Albans GI Plan: Stakeholder consultation report

The workshop was held at SADC's offices on 1st February from 2-4.30pm, facilitated by Richard Hardy and Gill Keeley (SADC), and Andrew Tempany and Alex Massey (LUC). Attendees were split into 4 groups and considered three subject areas/exercises to inform development of the GI Plan, following a short introduction to the work by LUC. Exercises considered: Visioning, Proposals and Projects and Delivery. Findings and LUC responses (where appropriate) are summarised by group below.

Group 1: Visioning (LUC responses in bold)

- Vision is good but incomplete: accessibility important (Riders / cyclists go beyond river valleys cf. accessibility of Heartwood. Also cf. health: recreational routes as well as commuting ones. Consider recreational routes through, not just to / from. Consider value for health and sanity). **Agree**
- Land ownership + negotiation. **Agree, key point**
- Conserve + enhance. **Yes, agree, both concepts are important**
- Ensure adequate flow, esp in River Ver. **Yes, agree this is important**
- Provision for horse riders. **Agree, GI network should seek to accommodate widest range of users**
- Minimise impact of motorways / large scale transport corridors (opportunity for landscape improvements?) **Agree**
- Link to WCCF. **Agree, this should be explicitly stated**
- Need for principles / brief for sites? **A detailed consideration, for future work**
- V long term / aspirational vision (issue of 'hope value' of land). **Agree, vision must set long term framework**
- Slow take up of WGS compared to aspirations of WCCF
- GI as advance mitigation: get as much as can from developers now. **Yes, agree with principle**
- Tariff approach (cf. Marston Vale). **Interesting point for delivery considerations**
- Join the gaps e.g. Gorhambury. **Agree**

Group 2: Visioning

- Points 1 & 2 merged. **LUC to consider in re drafting**
- (Chalk) – River Valleys – enhance protection. **Yes, agree with principle**
- Orchards – food – healthy eating. **Agree, important, will add reference to value of orchards**
- Farmland. **Important part of wider landscape GI**
- Accessibility – seating – promotion
- Too many vision statements. **We will seek to make vision statement as concise as possible**
- Water statements?

- Gardens important part of green infrastructure **Agree with principle, but a detailed matter**
- Trees – streets – gardens – parks.

Group 3: Visioning

- Too long? – shorten description on river valleys. **LUC to look at**
- Plain English. **Agree**
- People / Quality of Life more prominent. **LUC to look at**
- Vision some elements too specific. **LUC will check that right balance is struck**
- More like actions than a vision. **We see that vision needs to set broad objectives and need for some 'action orientated' statements to help frame proposals and projects.**
- See accessibility / connectivity for people and wildlife. **Agree that this balance is important**
- The potential agri-environment schemes can offer. **Yes, useful point for delivery considerations**
- Essential that GI is well managed. **Agree**
- Vision – essential that can be continued. **Agree, vision and GI Plan should set long term framework**

Group 4: Visioning

- General support for vision
- Concern re future of GI assets in current economic climate. **Agree, and this will be reflected in general terms, in broad consideration of project delivery**
- Fundamental drivers of land management must be recognised – key to delivery. **Agree that this should be signposted**
    - Hedges Farm, Radbournbury Meadows, Heartwood, WCF, Stewardship, farm economy, farm shops, wood fuel, market place approach, chain of businesses involved
    - Transition Towns **Yes, important**
    - Joined up land management, sustainability
    - Effective woodland management **Agree**
    - Farmers markets – lack of local producers
- Land management changes – loss of dairy production – problems grazing on common land
- Resistance to change – raise awareness, education, understanding of the working landscape. **Agree**
- Need to promote local food agenda economy. **Agree with principle, but GI Plan can only go so far in this respect. Suggest that this is signposted**
- Space for water – consider hydrology, use of water and understanding of community use and impact on rivers / hydrology /

water supply. **Agree with principle of 'space for water'**

- Air quality – connecting cause and effect awareness of links between people's behaviour and consequences, how to mitigate.
- Education and choice.
- Public perception and understanding. **Yes, will be key to future success of GI**
  - Heartwood – self guided walk using iPhone downloadable maps not successful
- Informal recreation important. **Yes, agree**

Group 1: Projects and proposals

Project 1:

- Issue of grazing / fencing / secure gating users an issue cf. horse riders.
- (horse grazed pasture inappropriate)
- Horse riders – possible user conflict, therefore grazing issue would need to be resolved as part of delivery. **Agree, need to balance interests, to avoid user conflicts**
- Zoning / enclosure of commons problematic and needs full consultation
- Project idea good in principle
- Land ownership a key issue and opportunity **Agree** (but land too expensive; also Crown Estate land ownership issues)
- Must factor GI into S106s so developers actually deliver (general point). **Agree with principle**

Project 2:

- Rambler assoc. also have published radial route (cf. "Stoop"). **Can be cross referenced as appropriate**
- Could be low cost (way – marking + leafleting / awareness raising). **Agree**
- (Heartwood is only permissive. The Ramblers Association is concerned that permissive access can be withdrawn at any time and prefers more permanent access, e.g. as public rights of way)

Project 3:

- Cross valley links
- Positive response to project
- Focus on link to Nicky Line + area east of Harpenden (Harpenden-Leazey Bridge). **Yes, will make reference to this as priority area in the project**
- Good to reintroduce traditional landscape management practices to rivers. **Agree with principle**

Project 4:

- Potential for more naturalistic management to protect park archaeology. **Agree**
- Note importance of views to Cathedral (important views identified in Local Plan). **Agree, views are key and GI network can facilitate appreciation and interpretation of these**

Project 5:

- Web based resource likely to be beneficial if budgets limited. **Agree**
- Need for linked / joined up approach. CMS / Herts Direct. Town / Parishes. **Agree**
- Link to tourist benefits cf. St Albans, but also villages. **Agree**

Other potential projects:

- Look at character of land near Chiswell Green + Butterfly World - Link to Ellenbrook. **LUC to check**
- M25 excavation spoil + re-restoration an opportunity for open space.
- More consideration to non St Albans City / wider settlements e.g. Harpenden + villages (Redbourn + M1 barriers) – Hemel East. **LUC to check, part of this can be achieved through increased cross reference to the in progress Dacorum GI Plan and latest iteration thereof**
- Also Rambler Assoc potential project aspirations. **Noted above, in notes for project 2**

Group 2: Projects and proposals

- Communication is key. **Agree**
- Management practices – grazing, coppicing
- Resilience to climate change
- Project 3 incl. Colne River. **Yes, add**
- Management changes – Parish Councils
- Remove Beechbottom Dyke from Gateway. **Is a low key gateway to wider landscape and to Heartwood, so we consider it should be identified**
- Project 2 + 4 very similar
- Is 'Gateway' appropriate? **LUC to consider**
- Resources: Section 106, CIL, Big Tree project

Group 3: Projects and proposals

- Expand gateways. **Uncertain of meaning here**
- Woodland projects
- Missing out detail on the urban environment. **This is more a consideration for future, more detailed work, and is beyond the scope of this GI Plan**
- Urban greening

Project 1

- Management issue / needs sustainable management + better management of woodland. **Agree with principle**
- Ancient woodland
- Incl. ref to grazing + sustainable land mgmt. **Support principle**

Project 2

- Web – extend into town too
- Addressing 300m ANGST deficiency through better links, urban greening. **Yes, agree with principles**
- Sustainable functional travel too, not just leisure. **Agree**

Project 3

- Waymarkers along river – mills / trees – landscape features
- Pressure on aquifers. **Noted**
- Promote local food production. **Agree with principle**
- Importance of grazing. **Agree with principle**
- Ellenbrook – grazing good
- Increasing diversity in agriculture
- There is a local market demand for local produce
- Sustainable. Energy production
- Inevitable biomass CHP
- Woodland Trust links

- Rothampstead Research
- Lots already happening incl. Ver HLF Project
- Incl. ref to enhanced landscapes river corridors
- Extend this project to increase water quality + water availability. Rewetting, aquifer recharge, climate change adaptation + mitigation. **Agree with reference to Environment Agency Water Framework Directive data, enhancing water/ecological quality are key principles**

Project 4
- Add woodland creation. **Ok**
- New woodland planting – incl. urban greening here too. **Yes, agree**
- Add biomass. **Yes, understand relevance to project, when considering settlement edge sites such as Harper Lane/Harperbury**
- Add other gateways including railway station. **This project is more about settlement approaches from landscape and townscape interface, so this is perhaps too fine grain, although we understand the reasoning here**
- Views to Cathedral. **Agree, important**

Project 5
- More than web / technology
- Interpretation / signage / word of mouth
- Schools, fun days, guided walks
- Promote at locations in the urban areas
- Important to tie in proposals within neighbours. **Presume this refers to adjacent LPAs, in which case agree**
- Not just technology, but wardens, signs etc. **Agree with principles**
- Greater potential for tourism – use similar marketing strategies. **Agree with principles**
- Critical project – maybe put as No 1. **Agree regarding importance of this project. Projects as set out do not seek to create a hierarchy. They are to be prioritised individually on their own merits, in the GI Plan**

Tourism
- Weekend destination
- Promote more

- Day trip recreation and heritage
- Railway promotions

Agree with principles

Project 2 & 5

- Signage and interpretation at railway station gateways. **Agree with principle**
- Local access to countryside – walks in St Albans district rather than Lake District
- Good spread of proposals to reduce risk of habitat damage
- ANGST
  - Within 300m of where you live access to at least 2ha. St Albans not performing very well against the standard. **Is probably more about enhanced green links here, given high density urban grain of St Albans**

Group 4: Projects and proposals

- Support suggestions
- Need defined projects to attract funds. **We consider that 'strategic' packages of projects are probably most effective to attract funding for delivering multi functional GI**
- Woodland enhancement / links – restrictions e.g. Buncefield Oil Depot, land ownership issues. **Agree that land ownership negotiations will be a key early stage of project delivery**
- More land for allotments
- Corridors – rivers green links
  - Open spaces – management, District Council or Parish
- Interactive map

Group 1: Delivery

• Support at strategic level, with partnership working with adjacent authorities e.g. Watford. **Agree, partnership working is key**
• Links to Colne Valley, so cross boundary working / links key. **Agree with principle**
• Ramblers / footpath society / riders / cyclists:
  - Help plan detail due to local knowledge
  - Regular task groups e.g. providing way-markers + awareness raising (not legal issues). **Useful**
• Cycling group: need for / demand cycle routes
• CIL / S106
• Parish councils must have buy in at local level (inform neighbourhood plans). **Agree with principle**
• HLF an issue (is SADC an area of need?)
• Plan should think long term + look beyond current economic climate. **Agree**
• Private bodies – Rothampsted
• Issue of St Albans as dormitory town (few residents work here)
• Private landowners – Crown Estate (does this cover Gorhambury?)

Group 2: Delivery
• Tool for delivery - local government as 'enabler' • Community takes ownership.

Group 3: Delivery

- Ensure dev contrib. fit into District Strategy. **For SADC to consider**
- Groundwork, CMS – delivery bodies
- Need to work up costs in detail. A consideration for future work
  - Delivery bodies
  - Management costs
- Trust approach
  - Harperbury – the fund has not been sufficient for aspirations
  - Property assets
- Long term sustainability
  - Beech Bottom Dyke
- Localism
  - Voluntary and neighbourhood groups
  - Friends of groups
- CMS continued + Groundwork Herts e.g. Ver Valley
- Bring people together
- District Council local greenspace
- Natural England
- Landowners and agents
- Take advantage of opps as arise
- Most accessible prioritise? **A question of most multi functional and achievable projects as basis for prioritisation**
- Deliver GI now rather than wait for LDF
  - Better promotion of strategy. **Agree, potential link to wider application of interactive mapping/app project proposal**

Group 4: Delivery

- Sustainable food – need local directory , raise awareness of land resource.
- Development proposals – bring in benefits for land management / rural economy.
- Nature conservation SPD required to support progress. **Point for SADC to consider in future**
- Parish Council projects

- Redbourn new orchard at Old Station Yard
- Access improvements + nature conservation benefits

- Link to production – income to support projects
- Heartwood
  - Companies involved in projects
  - No. of initiatives and projects
  - Volunteers planting
  - New community orchard
  - Schools involvement – schools resource packs – within 15 mile radius 1000 children planting per wk, 2010/H planting. **Useful to signpost to**
- Public perception / understanding – countryside experience / sanitised view of public. **Agree, need for awareness raising**
- Assisted green commuting / routes to schools
- Butterfly World
- Woodland Trust offering funds for creation of new woodland, looking for sizeable land holding for new woodland.

Group 1: Map annotations

- Lots of barriers at Harpenden (is Rothampstead an opportunity?)
- Lee Valley: Bridleway – paddocks. May be case for bridleway here (not cycleway)
- Lee Valley: Small gaps missing – great opportunity
- Cathedral views protected in Local Plan
- Consider wider views / villages generally.
- Potential to negotiate with Lafarge for access on mineral sites
- Links to Harperbury development opportunity
- V. intensively used routes in lower Ver Valley. Need upgrade
- M1 barrier in many senses.
- Constructive negotiations with Lafarge at sites south of St Albans City

2 Summary findings from the document review

2.1 This section also includes messages useful for future, local level GI planning, and which go beyond the scope of this high level GI Plan. Where relevant, appropriate projects and proposals in the GI Plan (**section 3** and **Figure 3.1** in the main report) are also identified.

KEY MESSAGES FROM THE LITERATURE REVIEW, BY THEME

2.2 *The following documents were reviewed: The City and District of St Albans Greenspace Strategy, August 2010, St Albans and District Cycling Strategy, Hertfordshire Rights of Way Improvement Plan, 2008.*

Access and recreation (open space)

2.3 The St Albans Greenspace Strategy identifies quantity and accessibility standards for open space and play facilities, but not for quality of provision. The Strategy highlights that 75% of the population lack access to an accessible natural green space within a 300m walk. There is good provision of public rights of way, but improvements are needed to cycle routes, particularly in western areas of the District and linking schools to open spaces, to benefit children and young people.

2.4 Consultation as part of the Greenspace Strategy has indicated that residents have a preference for larger open spaces to small ones, and that poor open space quality was a key barrier to use. Watling Chase Community Forest (WCCF) is a key opportunity in terms of GI provision. It is primarily located in Hertsmere, but also covers parts of St Albans. The Community Forest covers over 18,000 hectares and provides considerable potential for access and recreation for St Albans residents. Initiatives such as the Woodland Trust Heartwood project and the St Albans City Green Ring should also be supported.

2.5 GI opportunities in **section 3** of the GI Plan which aim to improve access to open space include the St Albans Radial Greenway project (complementary to the City Green Ring expressed in the St Albans City Vision and the Alban Circle created by the Hertfordshire and North Middlesex Ramblers' Association) and the St Albans approaches and urban greening project. Potential enhanced lateral and town-country links, including those within the WCCF area, are also shown on **Figure 3.1** in the GI Plan.

Landscape character, experience, settlement setting

2.6 *The following documents were reviewed: Landscape East/Natural England, 2009: East of England Regional Landscape Framework: Landscape Typology Final Report, HCC, 2001: Hertfordshire Landscape Character Assessment, St Albans City and District Council/Urban Practitioners, 2009 St Albans City Vision, St Albans City and District Council/Urban*

Practitioners, 2009 St Albans Rural Vision, Watling Chase Community Forest Plan Review and Landscape Supplement, 2001.

2.7 The landscape context of the settlements in St Albans District comprises agricultural chalk plateaux cut by an intricate network of river valleys and settled valleys. Other aspects of the landscape experience include ancient woodland, wooded valley crests and heathlands and commons, which are often closely linked to settlements (Redbourn, Wheathampstead, Harpenden). None of the District is covered by national landscape designation, although Redbourn, adjacent to Dacorum, lies in close proximity to the chalk landscapes of the Chilterns AONB within Dacorum Borough. The Watling Chase Community Forest, which has aspirations for large scale woodland creation, washes over large parts of the District in the south and fringes St Albans City.

2.8 A number of the settlements have edges and approaches which have enhancement potential e.g. exposed edges of Harpenden overlooking the Lea Valley, and many of the approaches to St Albans, which could better utilise the Roman heritage of the city and its relationship to the floodplains of the Ver (see **project 4** in the GI Plan). The aspirations of the Watling Chase Community Forest could help increase the functionality of the land around the city, enhancing setting and maintaining separation between it an outlying villages and other large towns such as Hemel Hempstead, within Dacorum Borough. The Vision documents produced for St Albans have identified a need for greater functionality in the open spaces of St Albans, e.g. natural play and opportunities for productive landscapes within the river valleys, which reference the historic landscape character.

2.9 Opportunities for improvement to landscape character and experience could be met through proposed projects for the River Valleys and heathland and habitat restoration across the District. These broad principles are shown on **Figure 3.1** in the GI Plan (see also **projects 1 and 3** in the GI Plan).

The historic environment

2.10 *The following documents were reviewed: Historic Landscape characterisation (HLC), HCC, 2001: Hertfordshire Landscape Character Assessment, Conservation Area Appraisals where available: St Albans City Vision and St Albans Rural Vision, Extensive urban surveys where available (Harpenden/Wheathampstead, Redbourn)*.

2.11 A rich historic landscape resource exists across the District, significant parts of it being the legacy of the Roman occupation (former Roman City of Verulamium). The Historic Landscape Characterisation (HLC) has identified large scale presence of intact early enclosure field systems across the rural landscape, allied to historic parklands and designed landscapes, ancient woodland and a network of river meadows.

2.12 The District is also characterised by a rich and diverse settlement and cultural pattern, stemming from the Roman

City site at Verulamium and associated strategic Roman Routes such as Watling Street. The fine old market town and Cathedral City of St Albans grew directly from the Roman settlement. However, this rich heritage is often underplayed and historic sites which have shaped landscape and townscape (including Verulamium, Beech Bottom Dyke and Nomansland Common) are often poorly linked and lacking interpretation (see **project 4** in the GI Plan). Key GI opportunities therefore relate to revealing aspects of the Roman and medieval settlements as foci for new links and new radial route (greenway) for St Albans, linking to outlying settlements and points of historic interest across the District, as well as a basis for tying Heartwood Forest into its cultural landscape (see **project 2** in the GI Plan). The river Valleys such as the Ver and Colne are key resources to link historic sites and opportunities for this should be used wherever possible (see **project 3** in the GI Plan).

Health and deprivation

2.13 *The following documents were reviewed: The City and District of St Albans Greenspace Strategy, 8 August 2010, St Albans and District Walking Strategy, 2009, Hertfordshire Rights of Way Improvement Plan, 2008.*

2.14 The St Albans Greenspace Strategy highlights deficiency in open space provision in the city of St Albans, within Colney Heath, and Park Street and St Stephens wards. This corresponds with pockets of health deprivation which exist in similar parts of the city. Public consultation indicates that 40-45% of residents use green spaces on a weekly or daily basis, although public transport to open space destinations has been identified as an issue. The District has both a Walking Strategy and a Cycling Strategy in place, and GI planning should support the delivery of these.

2.15 There is an extensive network of rights of way in St Albans, but off-road links from residential areas such as Park Street and Colney Heath to the rights of way network should be enhanced. Opportunities for improvement to healthy landscapes could be met through proposed projects for the St Albans approaches and St Albans Radial Greenway. See **section 3** of the GI Plan.

Functional ecosystems and flood risk

2.16 *The following documents were reviewed: Water Cycle Scoping Study, Strategic Flood Risk Assessment Volume 1, August 2007, Water for Live and Livelihoods - River Basin Management Plan Thames River Basin District, Tree Strategy and Policy for St Albans, Trees Against Pollution – A Strategy for Tree Planting and Air Quality.*

2.17 The chalk rivers of the Lea, Ver and Colne all fall within this District and are important in terms of biodiversity, water supply, recreation and heritage, and are recognised as priority habitats in the UK Biodiversity Action Plan. St Albans green belt tightly defines all of the settlements within the District and provides an opportunity to directly link urban areas with the countryside. The Watling Chase Community Forest area partly falls within St Albans District.

It is intended to form 'a rich mosaic of landscape, within which land uses include farmland, woodland, villages, leisure enterprises, nature areas and public open space[1]. Combined, the green belt and the Community Forest should aim to develop the network of habitats, ecosystems and natural links between the countryside and the urban areas which have been defined by it.

2.18 The Watling Chase Community Forest Plan, the Tree Strategy and Policy for St Albans and the Trees Against Pollution Project aim to create a healthy environment, improve biodiversity and quality of life in the District. Opportunities to create further green links and carbon sinks along infrastructure corridors will be important elements of green infrastructure proposals. UKBAP habitats require protection and enhancement throughout the District and the enhancement and reinforcement of these environmental assets will be important in guaranteeing the success of green infrastructure (see **projects 1 and 3** in the GI Plan). Flood risk will pose problems to each of the settlements along the District's rivers and the management of culverts, pinch points and floodplains along their routes will need to incorporate more naturalistic solutions such as expanded wetland areas and space for water (see **project 3** in the GI Plan). At a strategic level, the landscape quality of the Chilterns AONB could also potentially become affected due to rising abstraction levels in the lower reaches of its rivers tributaries. These broad principles are shown on **Figure 3.1** in the GI Plan.

[1] Watling Chase Community Forest Plan Review

Productive landscapes

2.19 *The following documents were reviewed: Natural England mapped data on traditional orchards, Woodland For Life: The Regional Woodland Strategy For The East Of England, November 2003, Watling Chase Community Forest Plan Review, 2001, St Albans City and District Core Strategy Consultation Spatial Strategy and Options for Growth, October 2010, Hertfordshire Low & Zero Carbon Technical Study – Final Report, March 2010.*

2.20 The current provision of allotments means that rural areas with low housing density (e.g. Sandridge) have poor access to allotments. The bulk of people waiting for an allotment are however, in the City and central wards. There is an opportunity to improve both the quality and value of many allotment sites, especially by improving facilities, signage, security and parking. Provision of new sites could improve accessibility to allotments for those living in rural areas and address the pent up demand that is concentrated in the City and District and Central areas. The Draft Greenspace Strategy suggests a quantity standard of 4.5 sq m/person in most areas but higher provision in Colney Heath, Harpenden and Wheathampstead.

2.21 An opportunity exists to provide new biomass fuel sources (e.g. woodland managed as short rotation coppice) in areas of landscape restoration/remediation (such as mineral sites)

to meet the energy needs of existing high density heat demand areas identified in the Low and Zero Carbon Study and areas targeted for high density new development. There are a number of potential sites within the Community Forest that offer opportunities for woodfuel energy production close to areas of energy demand (e.g. Radlett Aerodrome/Frogmore site). The Watling Chase Community Forest Plan Review cites as examples the potential to generate heat and power for schools on the urban rural boundary from biomass grown on adjoining (currently) arable land as well as large new housing developments. These woodlands could provide other valuable functions including provision of natural greenspace within walking distance of people's homes.

Land remediation

2.22 *The following documents were reviewed: St Albans Strategic Housing Land Availability Assessment (SHLAA), Hertfordshire Minerals and Waste Development Framework for Hertfordshire – Waste Core Strategy, St Albans LDF – Core Strategy, St Albans LDF – Core Strategy, Liz Lake/HCC:: Landscape and Visual Impact Assessment - Re-restoration sites, Hertfordshire, Indices of Multiple Deprivation (IMD), National Land Use Data (NLUD).*

2.23 Any future extension of Hemel Hempstead into St Albans District will require careful management to ensure existing areas of Green Belt and landscape are enhanced in this zone. Primary rail and road infrastructure corridors (M1 & A414) could allow for greater permeability across the District by providing habitat links across these barriers. Areas of high deprivation such as Batchwood, Sopwell, Park Street, Cunningham Colney Heath, should be targeted for regeneration, while parts of St Albans could benefit from improved green links to areas surrounding the City, notably to the south (see **Figure 3.1** and **projects 2 and 4** in the GI Plan).

2.24 A number of sites (outlined in Liz Lakes report) within the district which are former mineral extraction sites provide interesting landscapes with an enormous resource potential in landscape, recreational and biodiversity terms. However, due to the pervious and outdated restoration techniques used many of them have the potential to be re restored and become key infrastructure assets throughout the District. Further commentary on this is provided in the 'Land Remediation' functional analysis at **section 2** of the GI Plan and at **Appendix 3**.

Nature conservation

2.25 *The following documents were reviewed: East of England Biodiversity Mapping Project 2005, Hertfordshire Biodiversity Action Plan 2006, Hertfordshire & Middlesex Wildlife Trust, County Wildlife Sites, Ancient Woodland Inventory, Natural England ANGSt Analysis for Hertfordshire 2010.*

2.26 The primary land use across the north of St Albans District is agricultural, with a network of woodlands, including ancient woodlands. The proposed Heartwood Forest spans over 383 hectares (ha) between St Albans in the south and Harpenden in the north.

2.27 River corridors form one of the key nature conservation features of the District, comprising sections of the Lea, Ver and uppermost reaches of the Colne. It is not only the rivers themselves that hold value but associated wetland habitats, such as Water End Meadows – a linear County Wildlife Site (CWS) along the Lea. The District supports almost 1,192ha of woodland, over half of which is broad-leaved. Ancient semi-natural and ancient replanted woodland is typically fragmented and occurs in relatively small patches throughout the District. The cluster immediately north of Sandridge stretching to the east boundary with Welwyn Hatfield Borough (Symondshyde Great Wood) will undergo expansion under the Heartwood Forest project.

2.28 There are two Sites of Special Scientific Interest (SSSI) in St Albans District – Bricket Wood and Moor Mill Quarry West. Bricket Wood SSSI, occupies nearly 73ha. This large remnant of lowland heath has developed wet habitats as a result of poor drainage. Part of the site is ancient oak-hornbeam woodland. Encroaching scrub occurs.

2.29 County Wildlife Sites occur throughout the District. The largest of these include the grassland mosaic habitats in the north of the District, such as Gustardwood Common, Nomansland Common and Redbournbury Meadows. The large, ancient replanted Prae Wood, and associated CWS lie close to the city centre. A network of gravel pits occur in the south of the District, including, for example, the Quarry at the former Radlett Aerodrome, Moor Mill and Park Street Pits and Smug Oak Yard Pit.

2.30 Four Key Biodiversity Areas occur within the District. The Upper Colne Valley is a mosaic of wetlands and heath. Each of Bricket Wood / Moor Mill and the Upper Lea Valley comprise mosaics of wetlands, woodlands and heath. The River Ver / Gorhambury supports wetlands and woodland habitats.

2.31 The East of England Biodiversity Map identifies areas for buffering of fragmented habitats through St Albans itself and south to Frogmore, a narrow belt south of the Lea between Wheathampstead and Batford, north east of Hemel Hempstead, and in the south west of the District between Bricket Wood and Abbots Langley. See **Figure 3.1** in the GI Plan).

2.32 The two most common threats to ecologically-valued habitats across the District are first the relatively small and isolated patch size, which has inherently limited viability in the long term, and second, the conflict between recreational use and nature conservation. The Woodlands Biodiversity Action Plan (BAP) identified additional key threats as the lack of / changing management practices. The Wetlands BAP identified additional threats of low water levels and drainage, natural succession, nutrient enrichment, acidification and pollution.

2.33 Core areas identified in the Heathland BAP for restoration and creation include the Harpenden-Wheathampstead Complex (c.30ha heath and acid grassland achieved through restoration of Nomansland Common and Gustardwood Common, plus 10ha minimum of heathland-type habitats

created on agricultural or forestry land to enlarge and buffer these (dependent on geology / soils). A second core area is the Upper Colne Valley where restoration of c.35ha (e.g. Colney Heath and Bricket Wood Common) and creation of 50ha of heathland-type habitats south of St Albans (associated with restoration of minerals workings) are highlighted.

2.34 Opportunities for improvement of nature conservation could be met through proposed projects for the commons, grassland and heathland restoration across the District. These broad principles are shown on **Figure 3.1 and project 1** in the GI Plan.

3 Summary findings from the functional analysis

3.1 In addition to highlighting issues which have fed into the GI Plan, cross referenced to relevant proposals and projects, this section also includes pointers for future, more detailed GI planning, drawn from the functional analysis.

THE FUNCTIONS – SUMMARY OF NEED, DEMAND, SUPPLY AND OPPORTUNITY IN ST ALBANS

3.2 For each function the methodology behind the GIS spatial analysis is summarised in italics, with summary findings and pointers presented afterwards. This appendix cross references to the mapping shown in **section 2** of the GI Plan (main report). For each function, consideration was also given to broad situations where functional need and supply mismatch may be exacerbated (potential longer term growth using initial options considered in the emerging Core Strategy as at October 2010).

Access to recreation

3.3 *The analysis considered the 2.5 km envelope around the main settlements in St Albans (using main settlements GIS data provided by Hertfordshire County Council). Accessible open space was mapped using open space datasets in the Open Space Study, together with other datasets such as Local Nature Reserves. Access links (paths and rights of way, promoted routes and cycleways) were mapped, as was point data for ROWIP priority projects. A number of open space provision standards were also applied, mainly in the form of Natural England Accessible Natural Greenspace (ANG) and Woodland Trust Accessible Woodland Standard Buffers. GIS spatial and visual map analysis was then used to identify gaps in provision and barriers to access, to identify potential foci for proposals.*

3.4 In St Albans City, there are few off-road links to the surrounding countryside to the north west and north east, and the A414 forms a barrier to access. Cycle provision is adequate, although some of the cycle routes run along roads, and more off-road routes should be promoted. Rights of Way network enhancements should ensure links are made between the city centre and the potential settlement edge growth locations (see **projects 2 and 4** in the GI Plan).

3.5 A deficiency in 2ha and 500ha ANG sites has been identified at Harpenden, the former of which should be prioritised for action. There are few sustainable access routes to the north of the town, and this is an issue which should be addressed (see **projects 2 and 4** in the GI Plan), also GI Plan **Figure 3.1**). The identified gaps in the cycle and rights of way network to the north of the town should be addressed and should incorporate provision of sustainable access/transport links to potential future growth locations.

3.6 Similarly deficiencies in 2ha and 500ha ANG provision also apply at Wheathampstead and Redbourn, with few sustainable transport links to the north of Wheathampstead. Redbourn is connected to the surrounding countryside by a network of rights of way, most of which link to the Nickey Line Cycleway, a cross district link which passes under the M1 into Dacorum.

3.7 Opportunities for access improvements could be met through proposed projects for the St Albans Radial Greenway and St Albans approaches. These broad principles are shown on **Figure 3.1**, together with enhanced connections to strategic routes such as the Nickey Line, and **project 2** in the GI Plan.

Prestige on Settlement Approach Corridors

3.8 *The analysis considered the 2.5 km envelope around the main settlements in St Albans. Using data developed for the earlier Hertfordshire V4C project, a series of assets and detractors were mapped around settlement fringes. Assets included open space and areas of woodland planting, as well as water bodies and main rivers. Detractors included degraded land such as mineral workings and industrial sites. These were mapped within a 500m buffer of main road and rail corridors on settlement gateways, to understand where experience of GI assets may be impaired currently and to inform the spatial direction of proposals. Detractors were also considered with landscape character areas of lower quality as identified in the Landscape Character Assessment, to target areas where landscape enhancement could contribute to GI proposals development.*

3.9 Within the St Albans main settlements, the experience of most of the GI assets is impaired to a degree due to major transport corridors. Existing woodlands in the transport corridor buffers should be used as a template for re linking sites along transport corridor buffers e.g. B653 south of Luton Hoo and in the Lea Valley on the north east edge of Harpenden, to enhance settlement approach here. Considering prestige and settlement approach more widely, Harpenden Common and the A1081 approach present an opportunity to create linkages to other heathland sites such as Nomansland Common, as well as to the existing proposals for Heartwood Forest (using green infrastructure to foil Wheathampstead's southern settlement edge (see **project** 1 in the GI Plan).

3.10 The analysis has indicated a need to re link woodlands which have become fragmented due to the M25 and recent/ongoing road widening works (shown on **Figure 3.1** in the GI Plan). Also to provide more effective and stronger landscape settings to historic sites such as Tyttenhanger Park which often lie in close proximity to detracting features. Woodland linkage opportunities provide potential to assist in delivering Watling Chase Community Forest Planting targets, as set out in the Watling Chase Community Forest Plan and Plan Review[i]. Such opportunities would also assist in enhancing the character of the Colne Valley and therefore help maintain the sense of separation between St Albans and smaller

outlying settlements such as Colney Heath and London Colney.

3.11 Within St Albans City, main settlement approach issues revealed by the analysis are the need to enhance the settlement approach on the A4147 (notable GI and heritage assets in this location, but a need for buffering woodland sites at Prae Wood and Gorhambury, where prestige is impaired by the road and by the M1 to the west/A414 to the south). Also the presence of detracting features and landscape erosion around Smallford and south of Oaklands College (A1057 Hatfield Road). This is part of the focus for a landscape enhancement and restoration zone at **Figure 3.1**, to tie into existing and in progress positive GI initiatives in this area, such as the Ellenbrook Field Country Park (and as part of the delivery of WCCF planting targets for the DeHavilland Plain landscape character area).

3.12 Other key opportunity areas in St Albans are the southern approaches adjacent to the railway line and the Ver/Colne Valley. The presence of minerals sites in this area and existing wetland at Frogmore create opportunities for enhancement and linkage to improve the settlement gateway via Park Street, and to deliver a range of other functions. This is one of the foci for the St Albans Approaches Project (**project 4**) described at section 3 of the GI Plan.

3.13 Other main issues relate to severance (M1, A414) and **Figure 3.1** sets out a series of strategic links to provide alternative means of access, as well as a radial greenway project (**project 2** at section 3) and associated series of radial loops/links to connect the river valleys, to connect the main assets on the St Albans gateways (linked and complementary to aspirations in the St Albans City Vision[ii]).

3.14 Enhanced woodland planting to the M1 corridor would reduce intrusion and re connect landscape and GI features, as well as improving the experience of key assets such as Redbourn Common and also of the Nickey Line. Enhancement of settlement approaches through new structural landscape could also link to strategic objectives for wider landscape e.g. wet woodland planting to Watling Street to tie into and re link the Ver Valley landscape. Potential growth to the east of Hemel Hempstead may mean that enhancement and greater connection t o existing strategic GI links is required e.g. the Nickey Line, to promote this more as a GI resource and to link to GI assets in outlying settlements such as Harpenden.

Health

3.15 *The analysis considered the 2.5 km envelope around the main settlements in St Albans. In addition to paths and rights of way and other access routes such as cycle routes, the Indices of Multiple Deprivation (IMD) were mapped, considering the 40% most deprived wards in the settlement within the District. Taking this with mapped information on barriers such as arterial transport corridors, enabled the analysis to target areas*

where green infrastructure could potentially address deprivation issues through enhanced linkages.

3.16 There is moderate health deprivation in the Batchwood, Colney Heath, Sopwell and Cunningham wards. Open space deficiencies have also been identified in the Colney Heath ward. These are therefore priority areas for improving quality and access to open space, access to sustainable transport and paths and rights of way (see **projects 2 and 4** in the GI Plan).

3.17 In many of the larger urban areas and locations along major transport corridors, air quality is usually affected. Poor air quality affects long term health, and public spaces, paths a rights of way and cycle routes should be buffered from pollution sources through tree planting, whilst these pollution levels should also be reduced.

3.18 The analysis has identified no significant health deprivation issues in Harpenden, Wheathampstead or Redbourn.

Sound ecosystems

3.19 *The analysis considered the whole District. Environment Agency Water Framework Directive (WFD) GIS data was used for the main rivers and their catchments, to understand issues of ecological quality, low flows and abstraction pressures. High intensity traffic flows and main roads were also mapped to provide a broad picture of air quality issues. These two datasets enabled targeting of strategic GI proposals and zones in terms of wetland enhancement and large scale tree and woodland planting.*

3.20 Interpreting the Water Framework Directive (WFD) data produced by the Environment Agency for river catchments, the riverine environment of the Ver and the Colne are identified as being of poor ecological status and vulnerable to abstraction and low flow pressures. Whilst this does not apply to the Lea, all three of the river courses and riverine environments are affected by clusters of invasive species along their length. Only the Ellen Brook (Colne tributary) is unaffected by low flows and invasive species.

3.21 As such, positive management of the Lea, the Ver and the upper stretches of the Colne and its various brooks within the District, is a priority. This should include enhancement and restoration of native wetland and riparian river corridors (see **project 3** in the GI Plan). Also additional wetland creation and aiming towards public and voluntary involvement in riverside management (including invasive species) through appropriate education may help alleviate the problems they cause throughout the river catchments.

3.22 In terms of potential air quality issues, whilst large parts of the principal transport corridors are partly wooded (M10 & M25) there is a need for additional woodland and hedgerow belts to reconnect existing woodland blocks and improve air quality (see **project 1** in the GI Plan). Priority foci for this, shown on GI Plan **Figure 3.1** are the M1 corridor in proximity to settlements such as Redbourn and potential future growth at Hemel Hempstead east). Also the A414 corridor where additional afforestation could also link existing woodland blocks (Prae Wood, Park

Wood and Birch Wood), and the M25, to re connect and buffer woodland sites around the communities of Chiswell Green and Bricket Wood. This could link to and expand mitigation proposals as part of the M25 widening and be complementary to the objectives of the Trees Against Pollution project.

3.23 Any proposed development surrounding St Albans and London Colney could place further abstraction pressures on the Colne and Ver, further heightening the need for positive management and wetland expansion.

Productive green environments

3.24 *This analysis considered the whole District, mapping provision of allotments, traditionally managed orchards and farmlands covered by higher level stewardship agreements, as well as land in organic stewardship. Patterns were noted in terms of distribution and opportunities for new provision noted. Performance against recommended provision standards (e.g. for allotments) was also considered.*

3.25 Main areas under Higher Level Stewardship in the District are: land on the eastern fringe of the District near the Ayots north of the Lea Valley, and land east of Hemel Hempstead and south of Redbourn. In addition there is a small area forming part of the Mymmshall and Walsingham Woods complex, most of which lies within the adjacent Welwyn Hatfield Borough. There are also small concentrations of organically farmed land (in Organic Entry Level Stewardship schemes), north and west of Harpenden and partly in the Lea Valley and north of Redbourn, partly in the Ver Valley. HLS and organic stewardship uptake are therefore key opportunities to enhance productivity and functionality of farmland landscapes in St Albans District. Both contribute to the objectives of the Farmland Conservation and Enhancement Zone and Landscape Restoration Zone shown on GI Plan **Figure 3.1**. There is the opportunity to extend organically farmed land beyond the valleys, more widely into these areas.

3.26 Throughout the District, rural areas with low housing density have poor access to allotments. Allotments are thinly scattered across the City and District with no particular areas of concentration, while the majority of people on the waiting list are in the City and Central areas. There is an opportunity to improve the quality and value of many of these allotment sites throughout the District. Also to provide enhanced urban greening and locally productive landscapes as part of GI proposals including river valley enhancement (**project 3**, section 3). Also through **project 4** at section 3. This project, which addresses principal approaches to St Albans, identifies the opportunity for community gardens and orchards, which would deliver linked benefits in relation to interpreting historic landscape character and land remediation (enhancing landscape character areas of lower landscape quality to the south of St Albans).

Conserving historic landscape character

3.27 *This analysis considered the whole District. Designated historic assets such as registered parks and gardens and Conservation Areas were mapped and the qualifying features of designation relevant to green infrastructure noted. Consideration was also given to non designated assets important to urban green infrastructure heritage in general. Ancient woodlands were mapped, and the proportion of both these and registered parks and gardens actively protected through schemes such as environmental stewardship identified. As much of this function is about understanding and conserving historic legacy, the Historic Landscape Character types identified as regionally rare by Hertfordshire County Council, were mapped. The aim was to understand distribution of historic landscape elements and boundary networks which could contribute to the green infrastructure network.*

3.28 Rare historic landscape types in St Albans District are Co Axial Enclosures, which significant occupy around 22% of the District area, mainly the farmlands between St Albans and Hemel Hempstead and land around London Colney, west of Napsbury Hospital and immediately north of the M25. Also a very small distribution of Watercress Beds in the river valleys (less than 0.1% of the District). The Co Axial Enclosures form part of the Farmland Conservation and Enhancement Zone on **Figure 3.1** in the GI Plan. In particular, historic landscape pattern between St Albans and Hemel Hempstead should be conserved to form a template for any future consideration of growth east of Hemel Hempstead. Conservation of locally productive landscape such as watercress beds forms part of the focus for **project 3** in the GI Plan (river valleys enhancement).

3.29 With the exception of the two Registered Parks and Gardens and the Conservation Areas little of the heritage resource is protected. Neither of the two registered parks is in an agri environment scheme (Gorhambury is adjoined by one to its northern boundary), although Napsbury has additional protection through part designation as a Conservation Area. There is a large ancient woodland resource, although most of this is un protected, with only a small minority covered by Conservation Areas (Childwickbury) or by agri environment schemes (Walsingham Wood/Mymmshall Wood complex, most of which lies outside the District) or enjoying other protection e.g. through SSSI designation (Bricket Wood).

3.30 Key opportunities are therefore to secure protection and enhancement for the historic woodland resource through HLS and also through additional broadleaf native woodland planting to reconnect sites, and take up of Woodland Grant Schemes. If this was concentrated around registered parklands (with sensitive landscape design), in particular Gorhambury, this could also help enhance their setting, context and historic landscape relationship. Another opportunity may be more sympathetic/appropriate management of strategic replanted ancient woodland sites e.g. Prae Wood, given its historic significance (pre Roman settlement, forms the setting to the Gorhambury Estate). Re linking of ancient

woodland sites through HLS could also create physical connections to the Heartwood Project, as well as contributing to woodland planting targets set out in Watling Chase Community Forest (WCCF) Plan, which covers a large part of the district (see **project 4** in the GI Plan). General woodland enhancement zones are also shown on **Figure 3.1** in the GI Plan.

Sustainability and Responding to Climate Change

3.31 *Within the 2.5km envelope of the main settlements, accessible woodlands were mapped using National Woodland Inventory data. Visual analysis of aerial photography was also undertaken, to understand distribution of street trees and urban greening. Gaps were noted as possible opportunity areas for green infrastructure.*

3.32 In general settlements within St Albans District display a relative density of tree cover in terms of woodland and in principal open spaces, although this is of course greatly reduced in high density, historic city, town and village cores. However tree cover within public realm is generally limited to these areas and there are comparatively few areas of street tree planting except in lower density leafy suburbs, or where mature woodland have been absorbed within later settlement growth e.g. Bernard's Heath/Marshalswick, in the northern part of St Albans City. Issues and opportunities relate mainly to conserving what exists and managing this appropriate/planning for succession planting and ensuring new tree planting in relation to redevelopment sites – use of the TCPA standards for enhanced urban tree planting of 80 street trees (of appropriately robust grade) per linear km.

3.33 Any future growth and redevelopment should plan for street tree planting (delivering the TCPA standard described above) as an integral part of the masterplan to ensure climate change adaptation. These broad principles are shown on **Figure 3.1** in the GI Plan.

Land remediation

3.34 *This analysis considered the whole District. St Albans has been mapped and analysed for this exercise in order to identify where former waste, restored minerals and contaminated land sites could be restored and aid the development of the GI network. Any disused mineral sites within the District were identified and their current use and surface condition were noted. Also considered in the analysis were the IMD (Indices of Multiple Deprivation) and the quality of the Landscape Character Areas in which the sites were located.*

3.35 Former mineral sites include the cluster along the M25 west of London Colney/Frogmore/Moor Mill, Smallford, Tyttenhanger Park, and Blackbridge, east of Wheathampstead.

3.36 The sites have formerly been used as mineral extraction sites and these provide interesting landscapes with considerable potential in landscape, recreational and biodiversity terms. However, due to the pervious and outdated restoration techniques used many of them have

the potential to be redeveloped once again and become key green infrastructure assets throughout the District.

3.37 Due to the number of mineral sites and their proximity to each other, proposals should aim to connect sites by a series of non motorised/green networks to increase the recreational facilities in the area and to restore the character of the landscape which has been eroded over time by the number of mineral and extraction sites. This could be brought forward as part of the St Albans Radial Greenway (see **project 2** in the GI Plan). See also Landscape Restoration zone around Smallford on **Figure 3.1** in the GI Plan.

Nature conservation

3.38 *Consideration was given to the whole District, noting distribution of internationally, nationally and locally designated assets. Cross referring to the earlier document review, main issues and vulnerabilities were noted. Hertfordshire Biodiversity Action Plan Key Biodiversity Areas and Living Landscape areas were mapped, to understand where there may be potential for enhanced landscape and habitat linkages through green infrastructure.*

3.39 Across the District the main barriers to habitat links are the transport corridors of the M1 (close to the west district boundary) and the M25 (close to the south) and parallel to this, the A414.

3.40 Aspects which could cause further degradation of habitats are potential settlement growth locations (St Albans fringe, especially on the west toward Hemel/on Hemel side of M1, with the M1 likely to delineate growth) and east towards Welwyn. There is also a potential associated impact on the existing greenbelt (e.g. north east of Hemel). Additional issues relate to potential future development including the Eco Park/Biomass area close to Radlett aerodrome (although this could present a GI and nature conservation opportunity, with appropriate design).

3.41 Opportunities for habitat improvements, restoration and enhancements in the District include ensuring the promotion of community forestry, such as at Watling Chase, Oaklands Smallford Campus, Ellenbrook Country Park and Moor Mill as well as the land to the west of Hatfield and east of Redbourn. Expansion of existing wetland features to create a varied wetland mosaic, for example, including wet grassland, carr and open water e.g. the Colne Valley is identified as suitable areas in the Wetland BAP (see **project 3** in the GI Plan). The Lower Ver is listed as Environment Agency Landscape Opportunity Area 28.

3.42 Core areas identified in the Heathland BAP for restoration and creation include the Harpenden – Wheathampstead complex and the Upper Colne Valley where restoration and creation of heathland-type habitats can be addressed (see **project 1** and **Figure 3.1** in the GI Plan).

3.43 Areas identified as GI focus areas include Heartwood Forest where consideration of non-car access to the future site is required, to alleviate potential pressures on

biodiversity resources. Objectives should also include strengthening GI along the Lea corridor, linking south to Heartwood and east to the complex of locally designated sites at Ayot Green / Welwyn. GI proposals should also aim to circumnavigate St Albans city and link to the Redbournbury KBA – connect locally designated sites at Verulamium and link toward Heartwood (see **projects 2 and 4** in the GI Plan). Habitats in close proximity to Bricket Wood area should be buffered while an extension of GI proposals linking south to Colne valley could also provided. These broad principles are shown on **Figure 3.1** in the GI Plan.

Experience

3.44 *The analysis considered the whole District. Using the Regional Landscape Typology as a starting point, the 27 rural landscape types of the region were assigned rarity based on percentage distribution. The three rarest landscape types were considered for analysis as these often form a potential focus for place and conservation orientated green infrastructure proposals (e.g. chalk landscapes). Their distribution was noted as was the percentage distribution as a proportion of the total regional distribution of the landscape type. Tranquillity, intrusion and night skies mapping were also used to build a broader picture of landscape experience and quality.*

3.45 The two regionally rare landscape types are the Settled Chalk Valleys and the Wooded Chalk Valleys. The Settled Chalk Valleys represent approximately 3.79% of the District area (note that this also represents 2.92 % of the total regional distribution of the landscape type). More widespread in distribution are the Wooded Chalk Valleys, which cover approximately 22.71% of the District. Significantly the Wooded Chalk Valleys within St Albans District represents some 18.42% of the total regional distribution of this landscape type. Both landscape types also occur within the Chiltern Area of Outstanding Natural Beauty, approximately 500 metres west of the District (covering the headwaters of the Ver Valley), and as such share some common characteristics with parts of the designated landscape.

3.46 Settled Chalk Valleys are defined by soft, rounded topography (sometimes steeper), seasonal and permanent watercourses and chalk grassland. Ancient woodlands are a feature of steeper slopes. Tree lined watercourses (such as the Ver) are distinctive, as are small scale field patterns and framed views down the river valleys.

3.47 Key characteristics of the Wooded Chalk Valleys landscape type include steep sided wooded valleys penetrating the 'upland' plateaux, with watercourses associated with valley meadows, also seasonal watercourses or winterbournes in upper parts. The type is associated both with the Ver and the Lea Valley systems in St Albans. Occasional distinctive 'open downland' character extending into adjacent plateau landscapes. A mixed land use of arable, forestry and pasture to valley floors, often interlocking pattern of ancient woodlands which define the valleys. Enclosure is variable, with species rich hedgerows.

3.48 As such the two landscape types represent some of the primary GI assets in the District. This is due partly to accessibility, landscape and visual character, biodiversity value and the fact that in the case of St Albans, the Settled Chalk Valley also forms part of the Ver Valley floodplain. Such valleys should therefore be conserved as such within St Albans, as they also contribute to the distinctive character of settlements such as St Albans and Redbourn (see **project 3** in the GI Plan). They also form a focus for interpretation of historic views e.g. to St Albans Cathedral.

3.49 Green infrastructure proposals should seek to enhance access from St Albans along the valley floor to link to the Chiltern Way and then the Nickey Line via Redbourn. Linking of valley crest woodlands including ancient woodland would also provide a stronger sense of valley 'definition' (landscape setting) and assist in strengthening landscape and habitat connectivity.

Flood attenuation and water management

3.50 *This considered the flood zones in the 2.5km envelope of the main settlements, and proximity to designated nature conservation sites, to understand vulnerabilities in the context of water level fluctuation.*

3.51 Future development in close proximity to the rivers within St Albans could exacerbate existing pressures in the area so identifying areas for wetland expansion may help alleviate this pressure. Any such development could aim to incorporate SuDS and flood storage areas in order to deal with both run off and groundwater / fluvial flooding. Main foci for the GI Plan are consideration of 'space for water' outside of main settlement pinch points.

3.52 A review by the EA of areas at risk of surface water flooding includes areas to the north of St Albans, which will require more effective flood management. The flood defence structure to the north of St Albans reduces pressures from the River Ver; however Sandridge and Marshalswick are at risk of flooding from groundwater and any potential future development in this area will need careful consideration and flood mitigation measures to ensure flood risk is reduced.

3.53 Any future urban extension to settlements is likely to increase pressures during periods of high flows and could inevitably lead to flooding of developed land. Any such development near the flood plain will need careful consideration which incorporates mitigation measures to ensure any flood risk is reduced. An enhanced wetland environment is shown on **Figure 3.1** in the GI Plan. This could also provide biodiversity benefits in terms of linking wildlife sites in the river valleys.

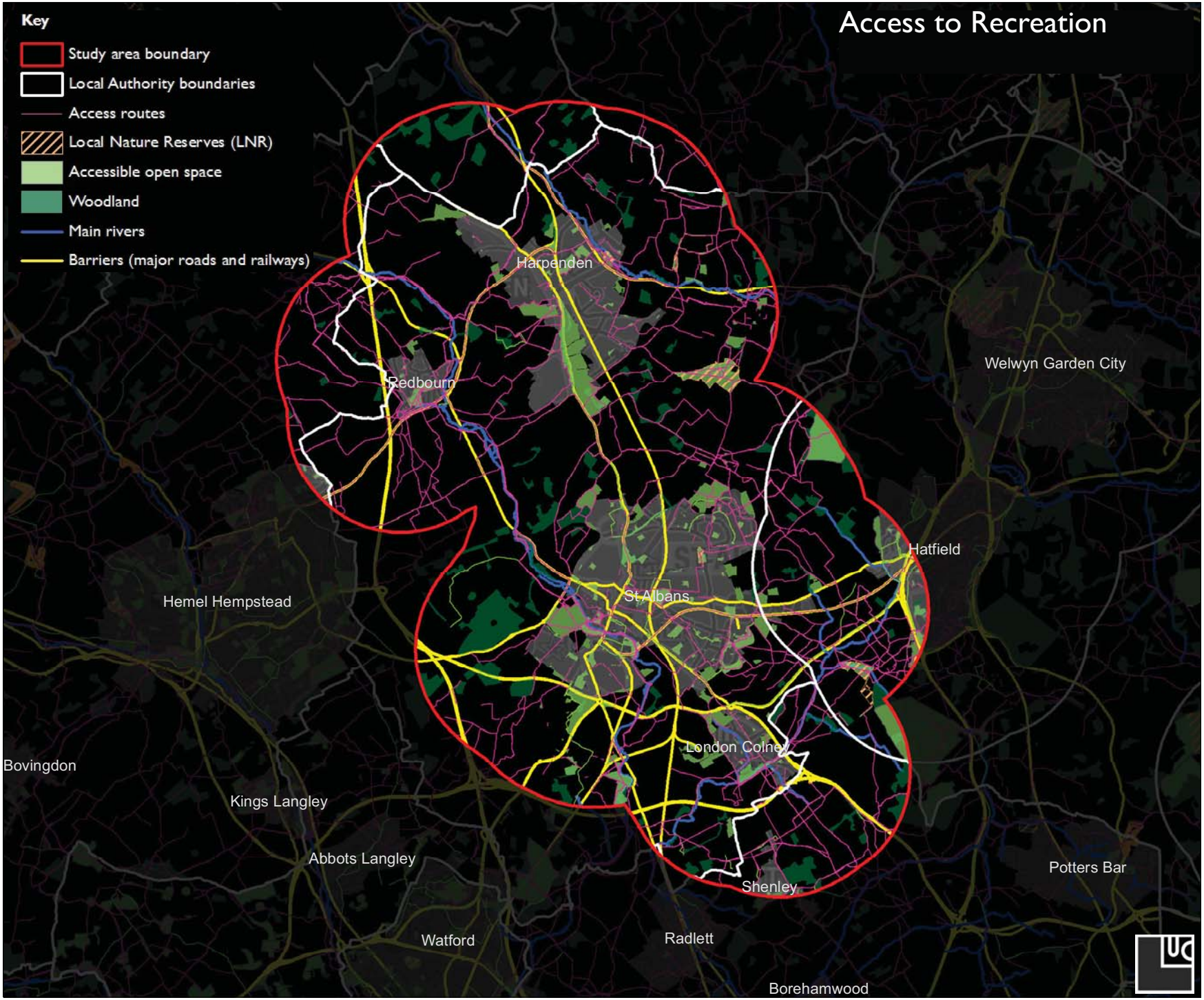
3.54 A large area of the Colne flood zone flows through the southern edge of London Colney (primarily open space) allowing areas to flood during high flows. However, potential flooding does pose a risk where the flood zone runs through the centre of London Colney as the flood plain is located within residential development.

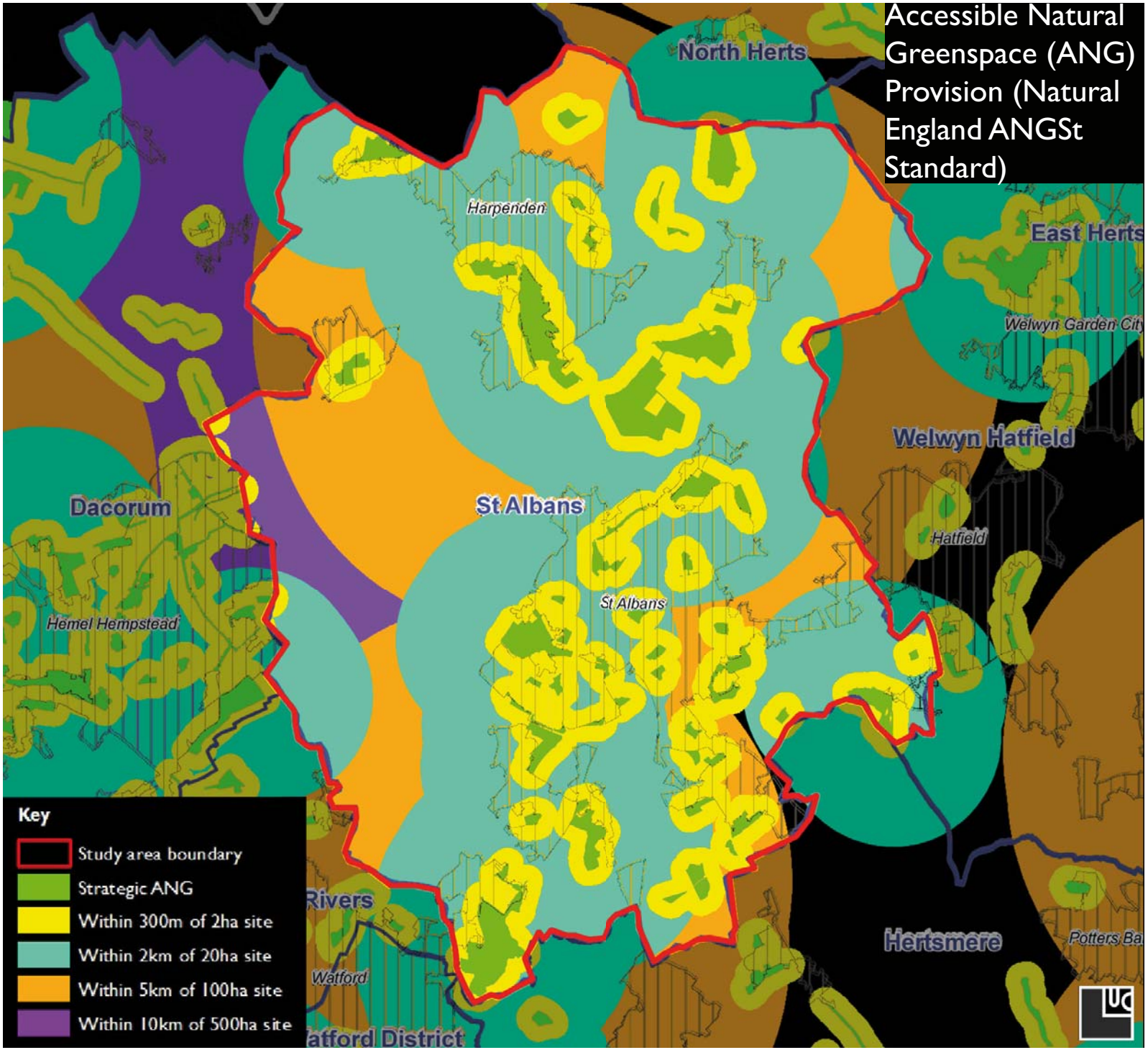
3.55 At Redbourn, the flood zone lies on the eastern boundary of the settlement and pressures associated with flooding are alleviated by open space. The flood zone lies between the A1583 and the edge of Redbourn, however ad-hoc development such as the caravan park, industrial estate and nursery are at risk of flooding.

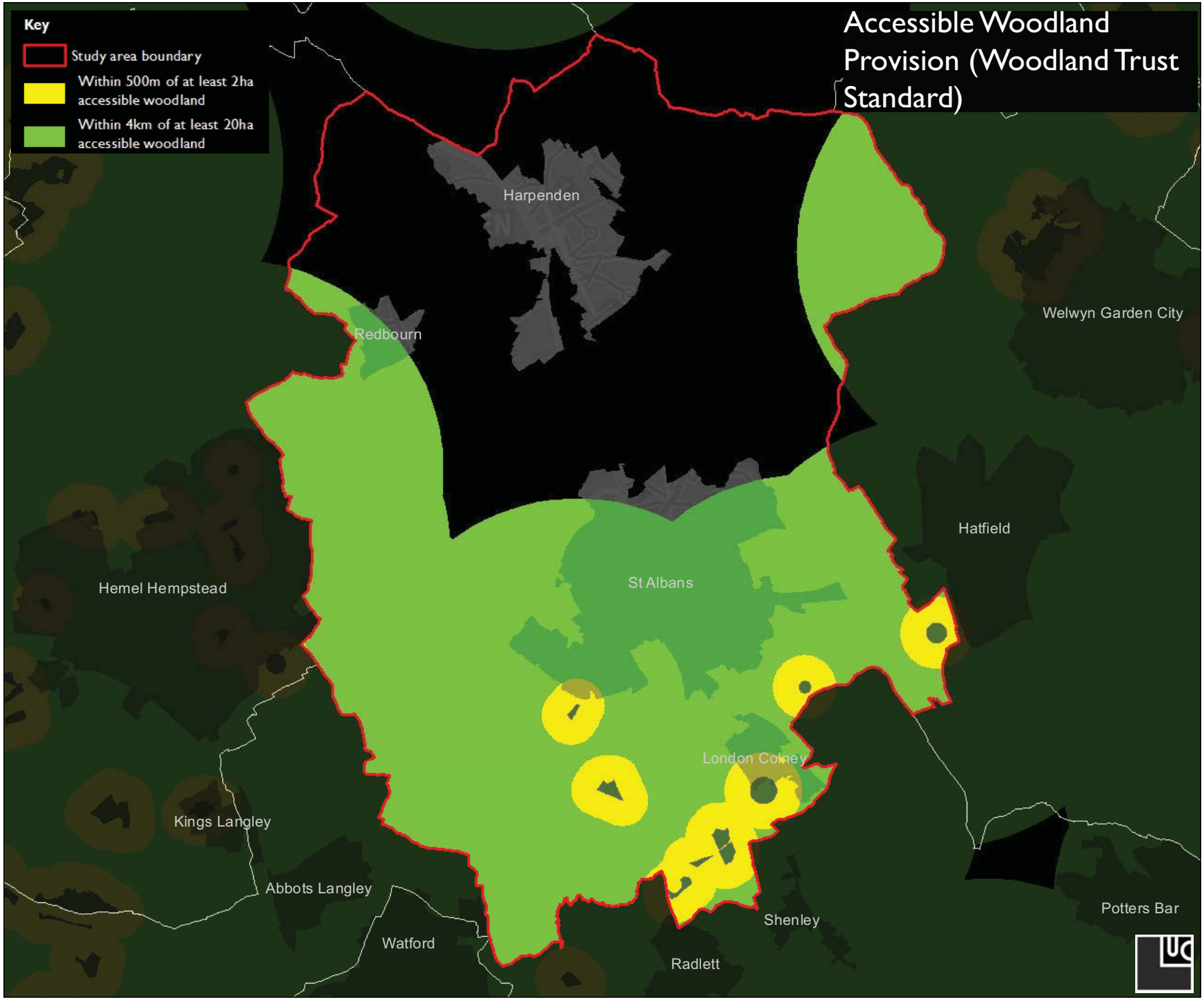
3.56 Large areas of floodplain are on the north of the settlement, whilst to the south flood defence structures are in place which helps prevent localised flooding during high flows.

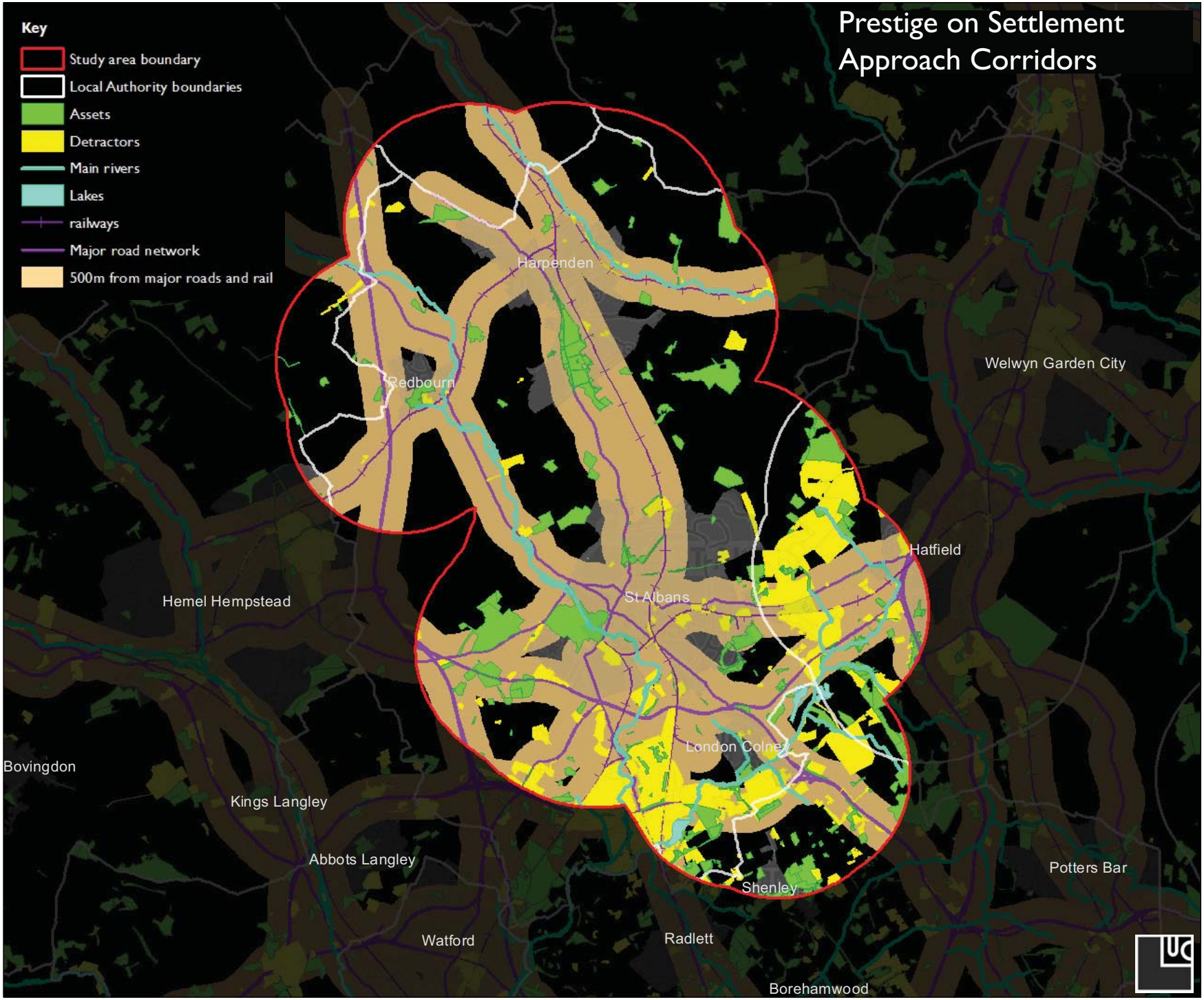
3.57 In terms of flooding issues at Harpenden, the River Lea's flood zone lies on the eastern side of the settlement. It is located within both developed land and open space. However where it lies in developed land, it has been heavily modified to reduce any potential risk. Where the river has been modified, pinch points such as bridges and culverts that can exacerbate to localised flooding have been created, for example at the Allied Business Centre.

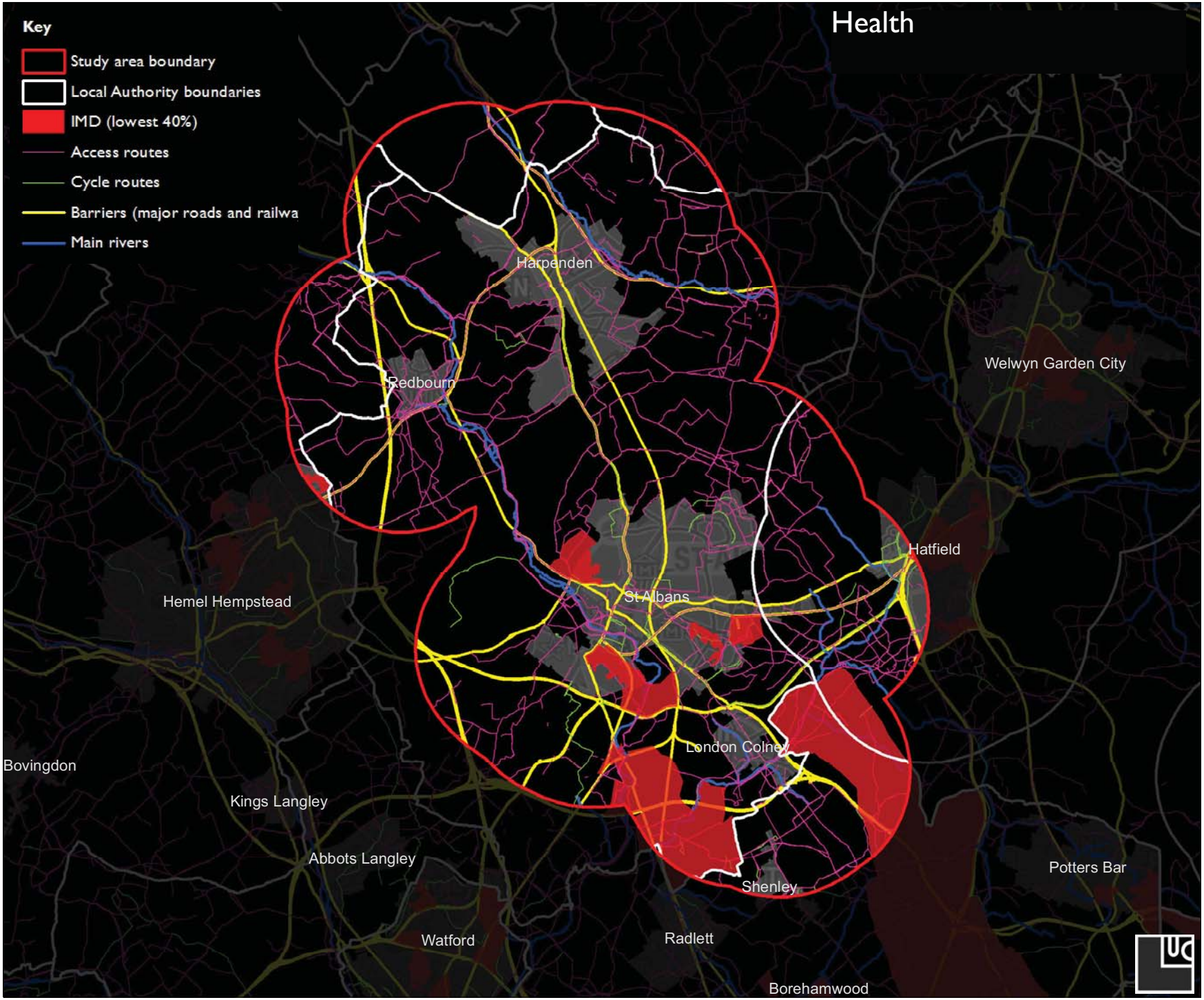
Functions Mapping:

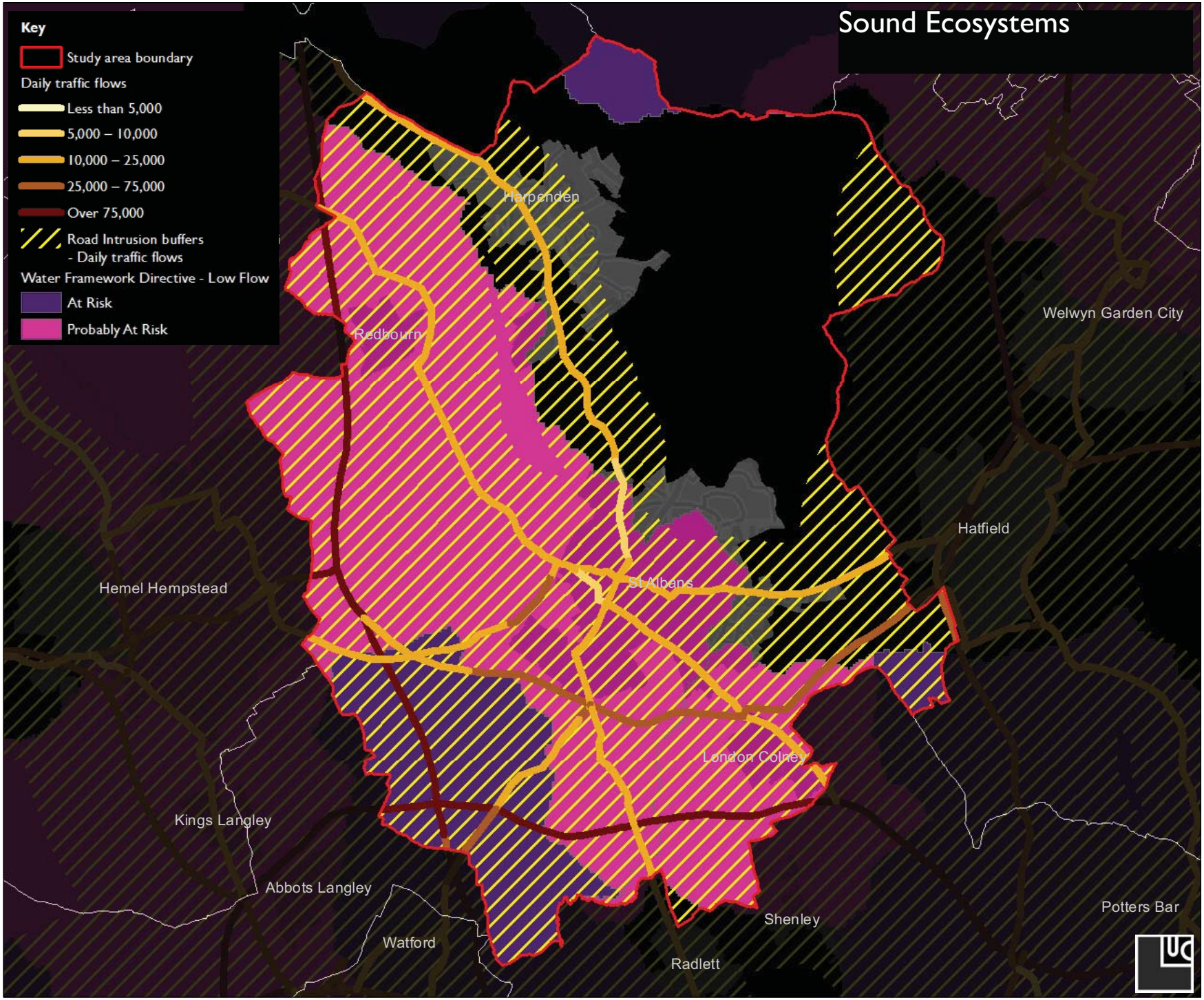

Access to Recreation
Key
Study area boundary
Local Authority boundaries
Access routes
Local Nature Reserves (LNR)
Accessible open space
Woodland
Main rivers
Barriers (major roads and railways)
Harpenden
Redbourn
Welwyn Garden City
Hatfield
St Albans
Hemel Hempstead
London Colney
Bovingdon
Kings Langley
Abbots Langley
Potters Bar
Shenley
Watford
Radlett
Borehamwood

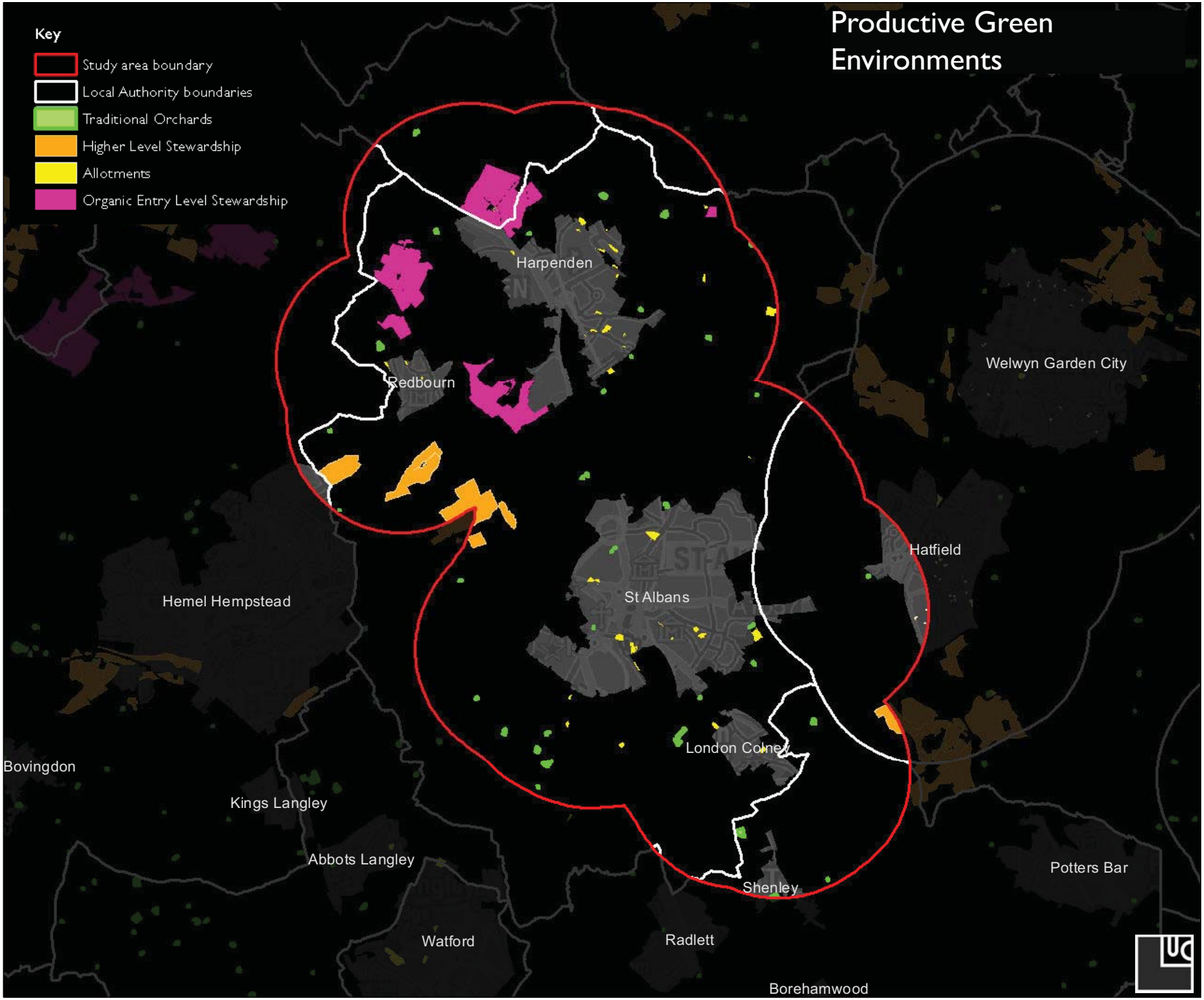

Accessible Natural Greenspace (ANG) Provision (Natural England ANGSt Standard)
North Herts
Harpenden
East Herts
Welwyn Garden City
Welwyn Hatfield
Dacorum
St Albans
Hatfield
St Albans
Hemel Hempstead
Rivers
Watford
Hertsmere
Potters Ba
atford District
Key
Study area boundary
Strategic ANG
Within 300m of 2ha site
Within 2km of 20ha site
Within 5km of 100ha site
Within 10km of 500ha site

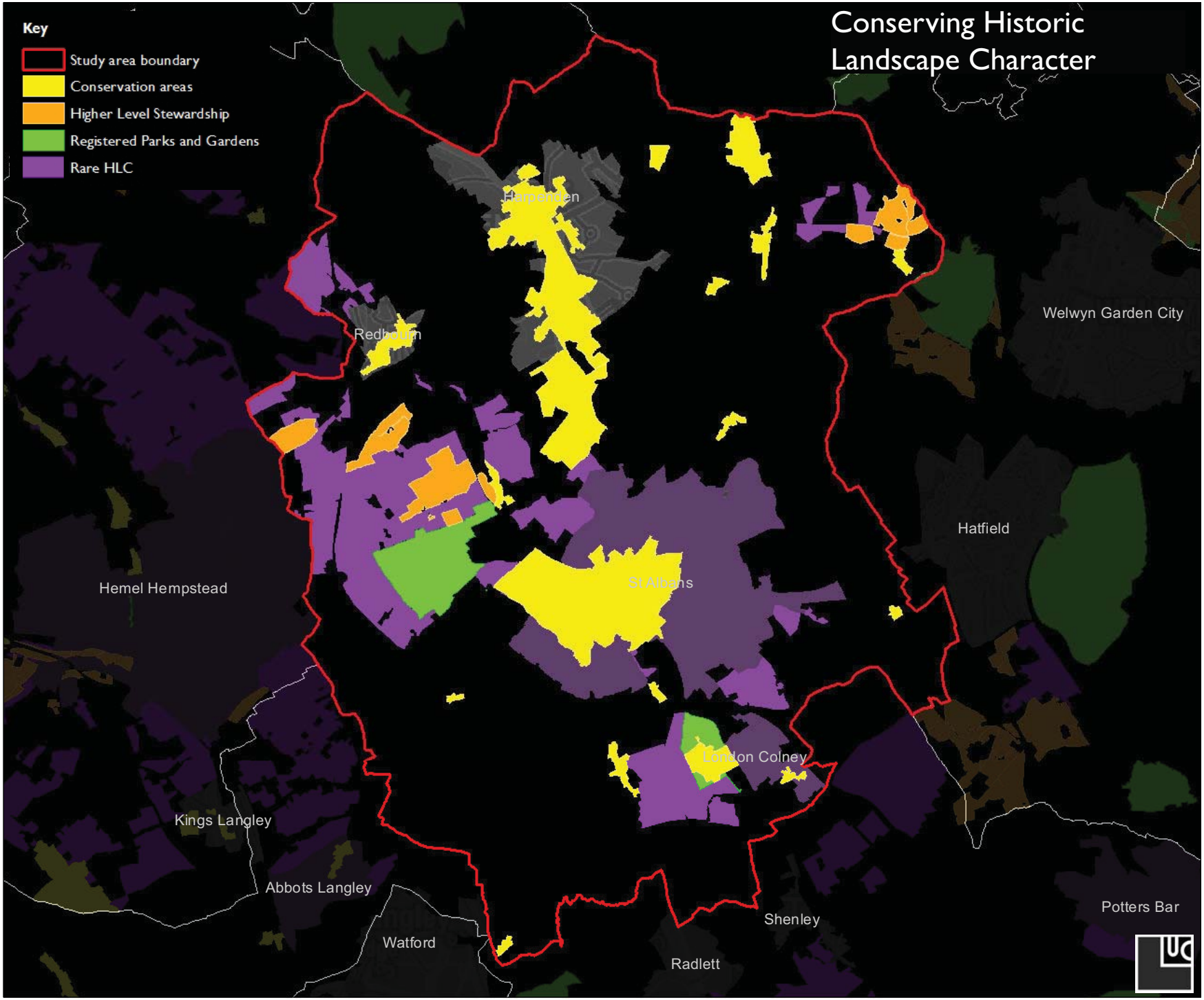

Key
Study area boundary
Within 500m of at least 2ha accessible woodland
Within 4km of at least 20ha accessible woodland
Accessible Woodland Provision (Woodland Trust Standard)
Harpenden
Redbourn
Welwyn Garden City
Hatfield
St Albans
Hemel Hempstead
London Colney
Kings Langley
Abbots Langley
Watford
Shenley
Radlett
Potters Bar


Key
Study area boundary
Local Authority boundaries
Assets
Detractors
Main rivers
Lakes
railways
Major road network
500m from major roads and rail
Prestige on Settlement Approach Corridors
Harpenden
Redbourn
Welwyn Garden City
Hatfield
St Albans
Hemel Hempstead
London Colney
Bovingdon
Kings Langley
Abbots Langley
Potters Bar
Shenley
Watford
Radlett
Borehamwood

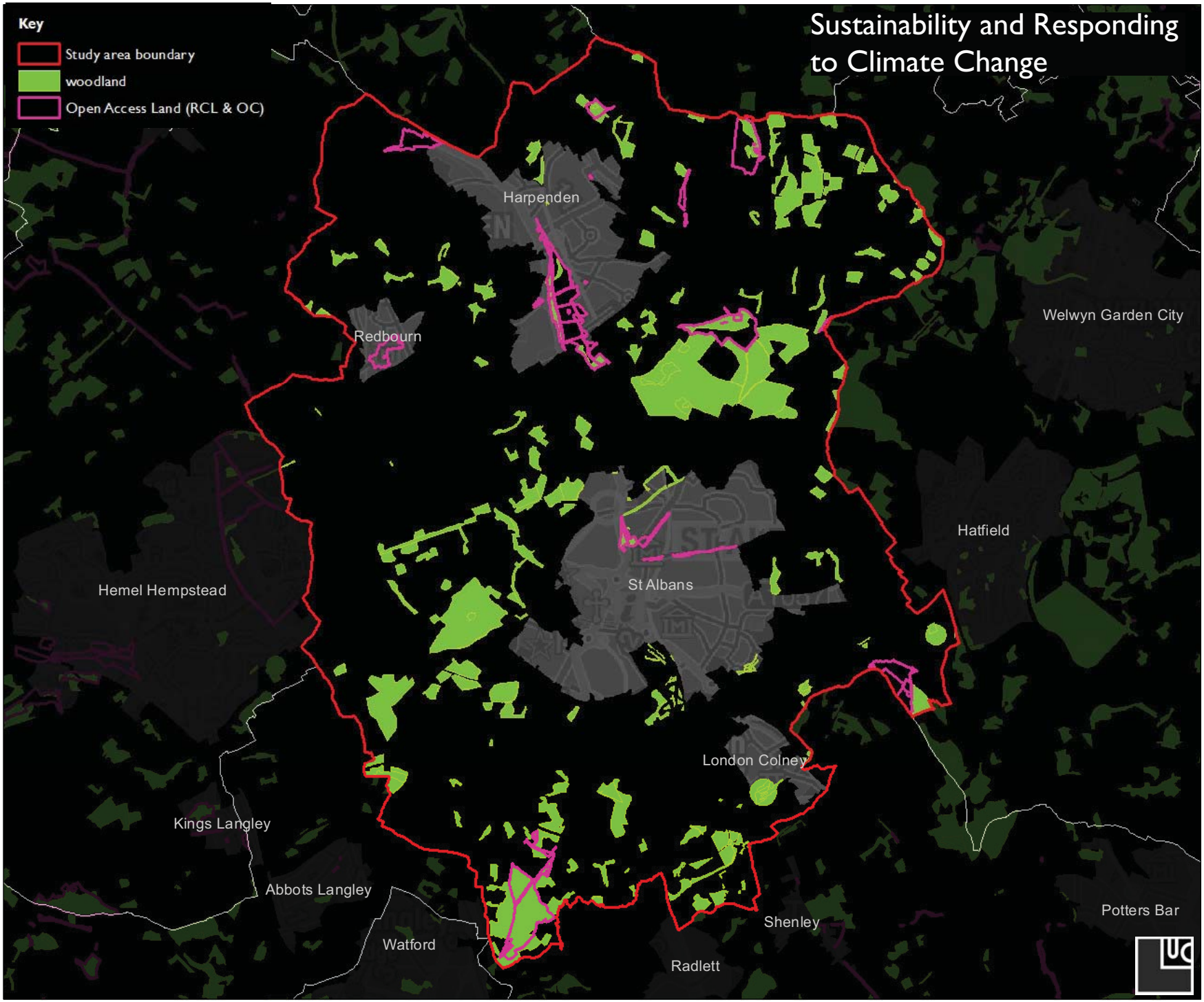

Health
Key
Study area boundary
Local Authority boundaries
IMD (lowest 40%)
Access routes
Cycle routes
Barriers (major roads and railwa
Main rivers
Harpenden
Redbourn
Welwyn Garden City
Hatfield
St Albans
Hemel Hempstead
London Colney
Bovingdon
Kings Langley
Abbots Langley
Shenley
Potters Bar
Watford
Radlett
Borehamwood

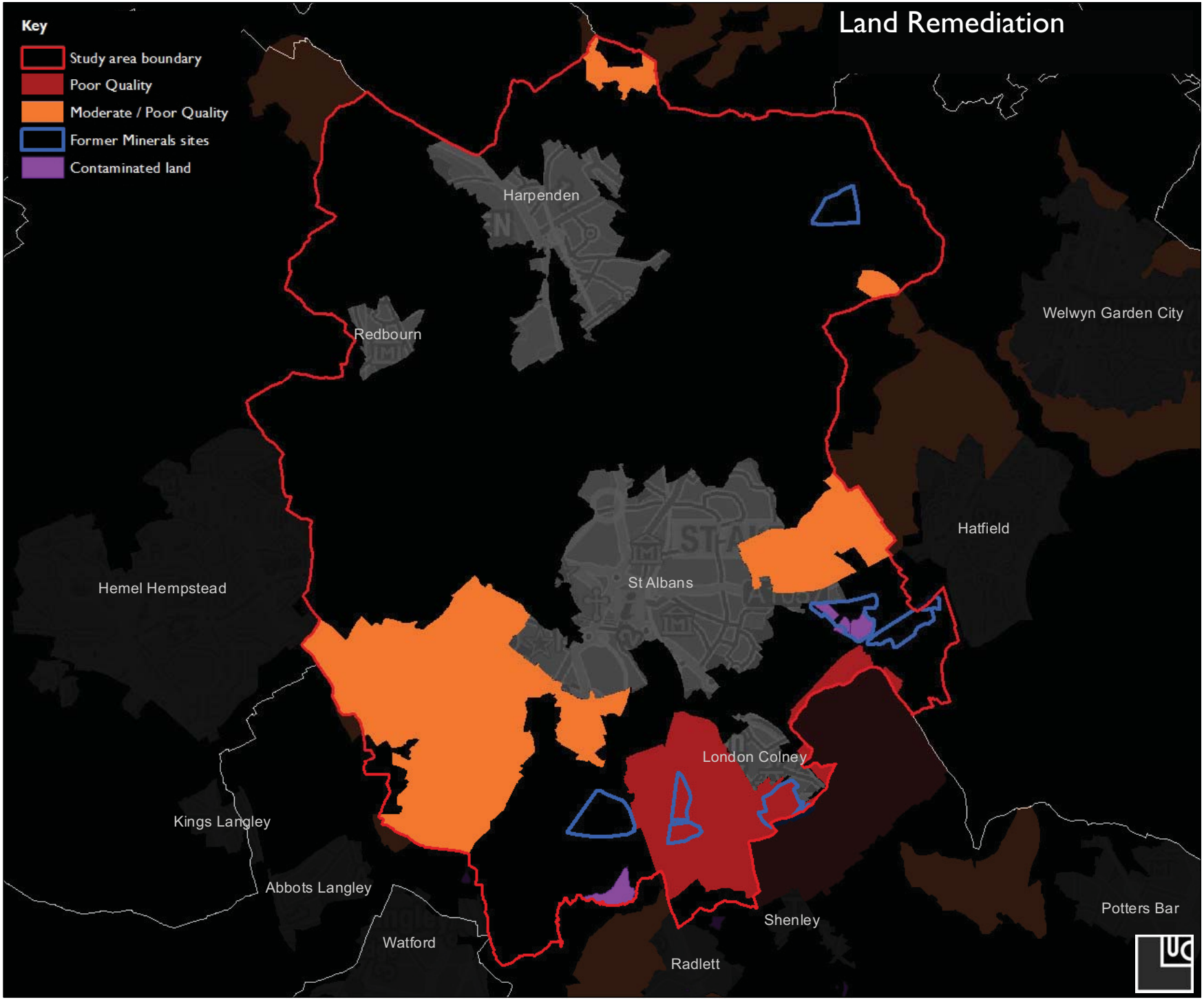

Sound Ecosystems
Key
Study area boundary
Daily traffic flows
Less than 5,000
5,000 – 10,000
10,000 – 25,000
25,000 – 75,000
Over 75,000
Road Intrusion buffers
- Daily traffic flows
Water Framework Directive - Low Flow
At Risk
Probably At Risk
Harpenden
Redbourn
Welwyn Garden City
Hatfield
Hemel Hempstead
St Albans
London Colney
Kings Langley
Abbots Langley
Watford
Radlett
Shenley
Potters Bar

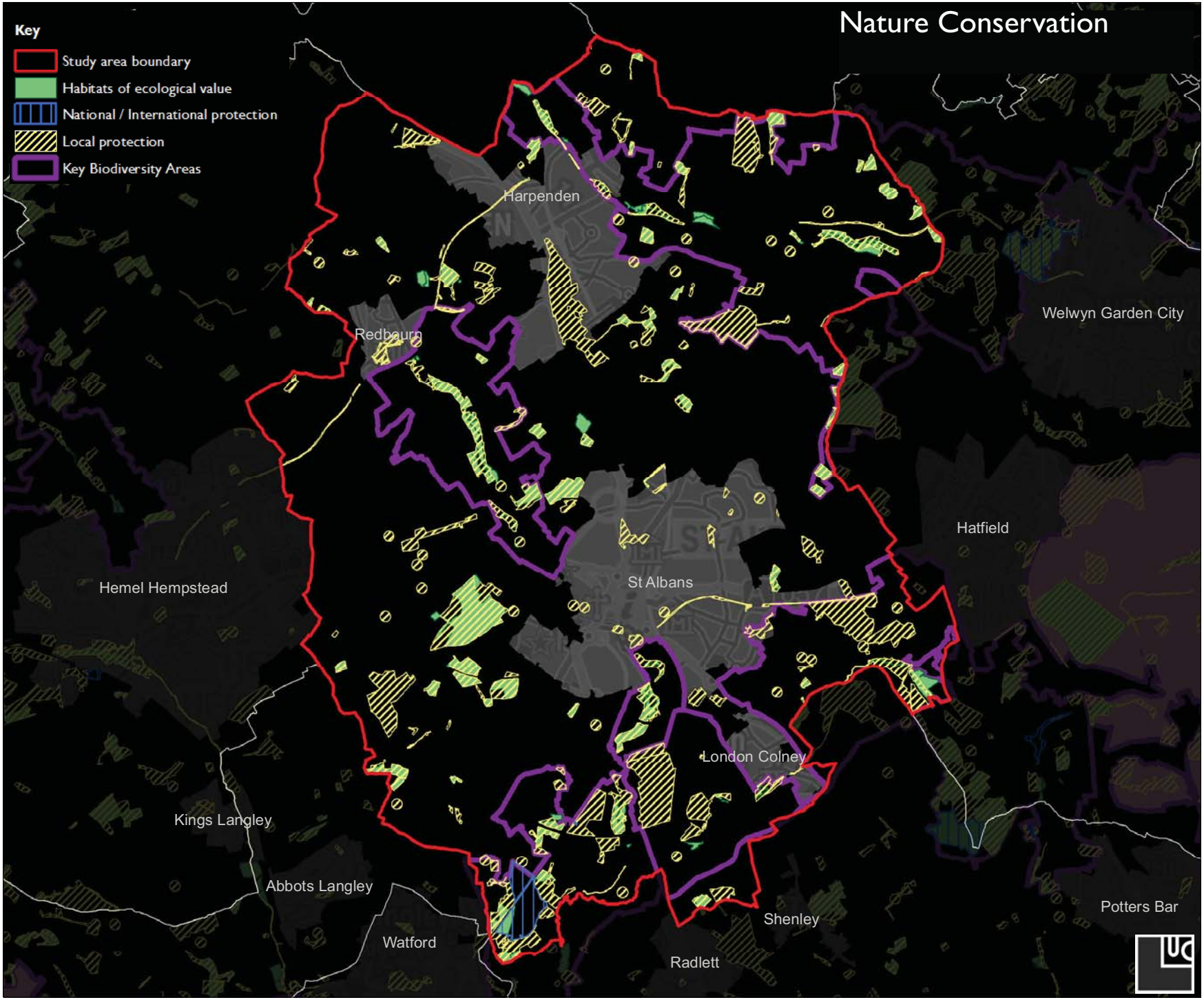

Key
Study area boundary
Local Authority boundaries
Traditional Orchards
Higher Level Stewardship
Allotments
Organic Entry Level Stewardship
Productive Green Environments
Harpenden
Redbourn
Welwyn Garden City
Hatfield
St Albans
Hemel Hempstead
London Colney
Bovingdon
Kings Langley
Abbots Langley
Shenley
Potters Bar
Watford
Radlett
Borehamwood

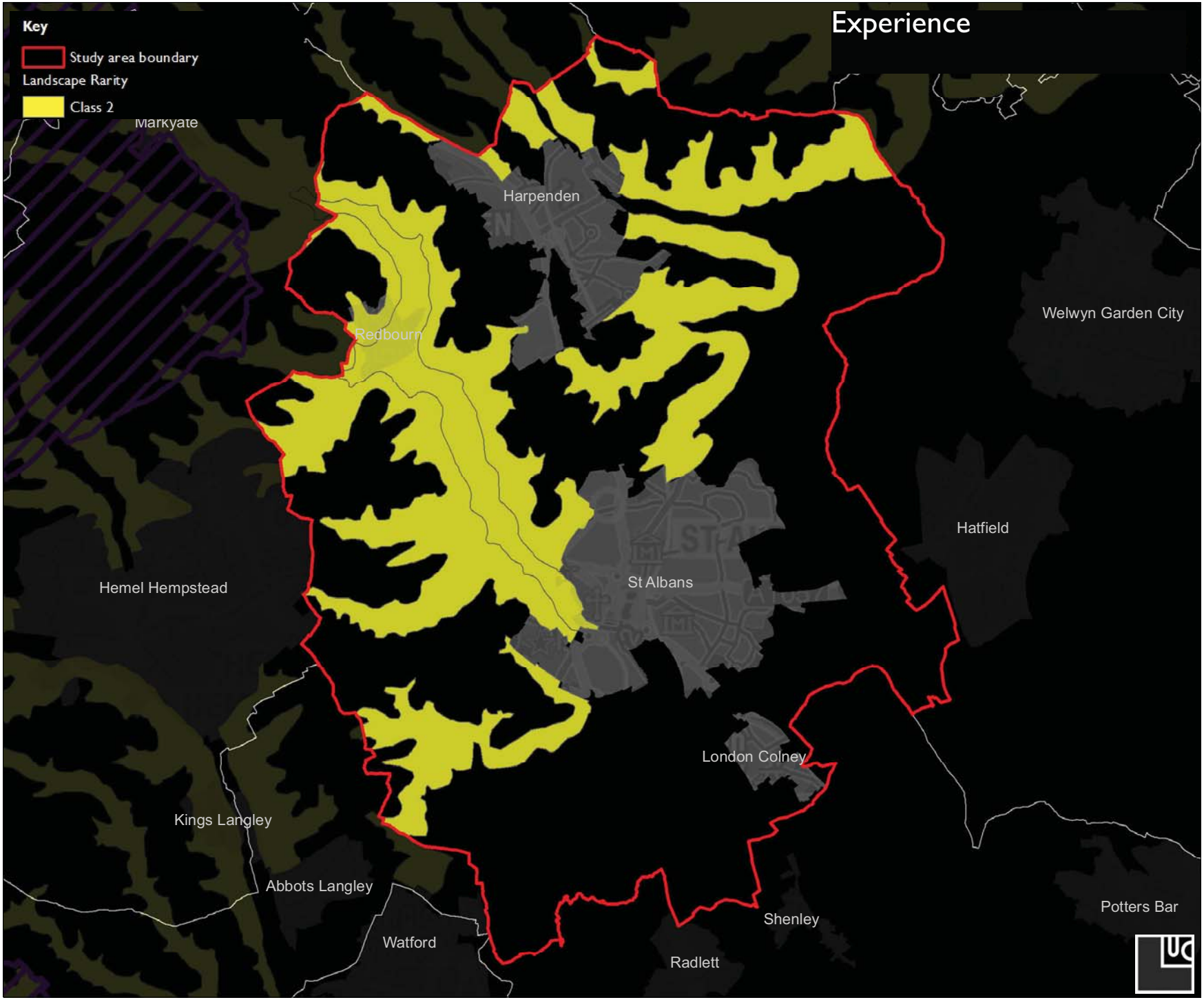

Key
Study area boundary
Conservation areas
Higher Level Stewardship
Registered Parks and Gardens
Rare HLC
Conserving Historic Landscape Character
Hemel Hempstead
Redbourn
St Albans
Welwyn Garden City
Hatfield
London Colney
Kings Langley
Abbots Langley
Watford
Radlett
Shenley
Potters Bar

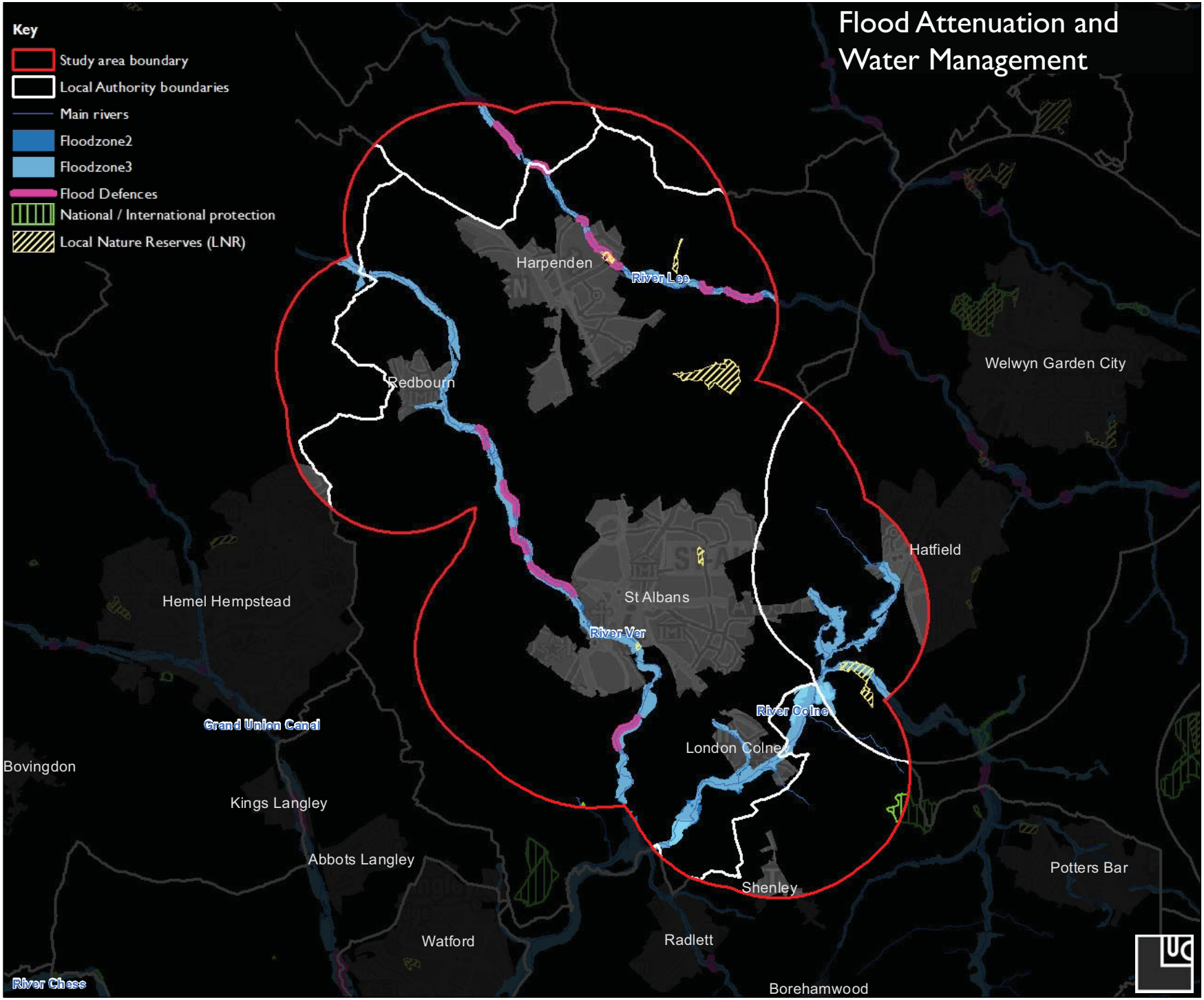
Sustainability and Responding to Climate Change




Land Remediation
Key
Study area boundary
Poor Quality
Moderate / Poor Quality
Former Minerals sites
Contaminated land
Harpenden
Redbourn
Welwyn Garden City
Hatfield
St Albans
Hemel Hempstead
London Colney
Kings Langley
Abbots Langley
Watford
Shenley
Radlett
Potters Bar


Nature Conservation
Key
Study area boundary
Habitats of ecological value
National / International protection
Local protection
Key Biodiversity Areas
Harpenden
Redbourn
Welwyn Garden City
Hatfield
Hemel Hempstead
St Albans
London Colney
Kings Langley
Abbots Langley
Watford
Shenley
Radlett
Potters Bar


Experience
Key
Study area boundary
Landscape Rarity
Class 2
Markyate
Harpenden
Redbourn
Welwyn Garden City
Hatfield
Hemel Hempstead
St Albans
London Colney
Kings Langley
Abbots Langley
Watford
Radlett
Shenley
Potters Bar


Flood Attenuation and Water Management
Key
Study area boundary
Local Authority boundaries
Main rivers
Floodzone2
Floodzone3
Flood Defences
National / International protection
Local Nature Reserves (LNR)
Harpenden
River Lee
Redbourn
Welwyn Garden City
Hatfield
St Albans
Hemel Hempstead
River Ver
River Colne
Grand Union Canal
London Colney
Bovingdon
Kings Langley
Abbots Langley
Shenley
Potters Bar
Watford
Radlett
River Chess
Borehamwood

[i] Watling Chase Community Forest 1995 **Forest Plan**, and **Watling Chase Community Forest: Forest Plan Review 2001**
[ii] Urban Practitioners 2009 **St Albans City Vision**

www.landuse.co.uk